

NORTHROP GRUMMAN

DEFINING THE FUTURE

Northrop Grumman Space Technology (NGST) Overview

August 30, 2005

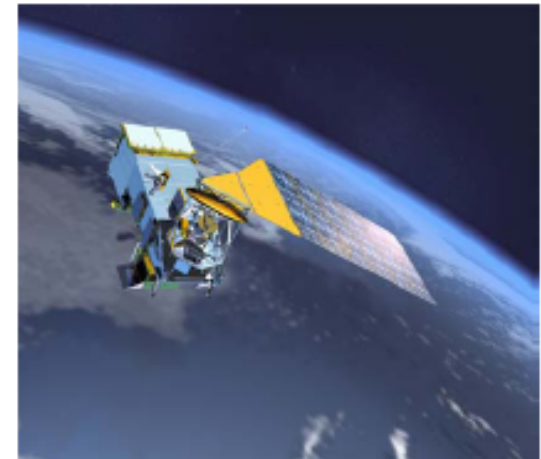
Steve Mason

Northrop Grumman Space Technology

Northrop Grumman Space Technology (NGST)

— *formerly TRW Space & Electronics*

- A leading producer of satellites, payloads, electronic systems, lasers and CNI avionics
- Strategically positioned to leverage and capitalize on advanced technologies
- 9300 employees
- \$3.3 billion 2004 sales
- Headquarters: Redondo Beach, California



NORTHROP GRUMMAN

NGST SatCom: Over Three Decades of Providing Increasingly Capable Solutions



Defense Systems
Communications
Satellite II

Restricted

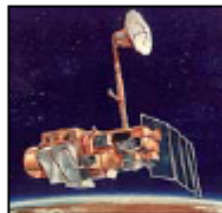


Fleet Satellite
Communications



INTELSAT III

Landsat 4
Downlink

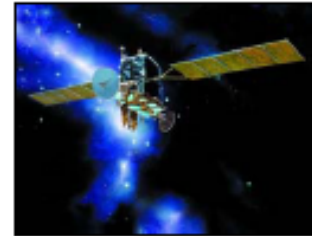


Milstar



Tracking and
Data Relay
Satellites

Advanced EHF



Gen*Star
Ka Broadband
(Astrolink)

Transformational
Communication
MILSATCOM



1970

1980

1990

2000

2010

- Provide "space nodes" to DoD networks
- End-to-end systems engineering for DoD systems
- Insertion of advanced technologies in space
 - Reduction to practice from the laboratory

NGST MilSatcom Capabilities Description

- **Northrop Grumman Space Technology (NGST) has significant heritage and current investments in the development of key SatCom technologies and systems**
- **Our technologies and investments are well-aligned with transformational communications**
- **As payload developer/provider for AEHF and TSAT, we are actively supporting the Transformational Comm. Architecture vision of a space-based network architecture**
- **Space-based communications networks are a critical element of the future C4/ISR architecture and achieving the vision of horizontal integration**
- **Protected communications is a key enabler of the net-centric battlefield**

NGST Expertise for "Control-Based Mobile Ad-Hoc Networking" Program

- Assured, protected, survivable broadband satellite communications
- Extensive data downlink and crosslink development experience
 - Kbps through Gbps for RF and Lasercom
- Communication-on-the-move from space
- Translation of Networking Protocols for use in space

NGST is very interested in partnering with firms and providing our space communications and networking expertise for this opportunity

NGST Points of Contact:

- Dan Azaren (310) 812-2110; E-mail: dan.azaren@ngc.com
- Joe Galins (310) 813-8102; E-mail: joseph.galins@ngc.com
- Steve Mason (310) 812-8633; E-mail: steve.mason@ngc.com